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10/776,232	02/12/2004	Frederick Ying-shu Chan	P08179US00/RFH	2623

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STITES & HARBISON PLLC
1199 NORTH FAIRFAX STREET
SUITE 900
ALEXANDRIA, VA 22314

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LIU, LI	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/776,232	**Applicant(s)** CHAN, FREDERICK YING-SHU	
	Examiner Li Liu	**Art Unit** 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12 February 2004.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-14 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-14 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 14 February 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jasti (US 2004/0156579) in view of Pfeiffer (US 6,925,219) and Evans et al (US 2005/0174563).

1). With regard to claim 1, Jasti discloses a bi-directional wavelength division multiplexed (WDM) optical communications network (Figure 1) having a protection switching (116 and 124 in Figure 1) capability within two bi-directional optical waveguides (112 and 114 in Figure 1), wherein the transmission scheme can accommodate one or more optical signals at distinct wavelengths or bands of wavelengths (e.g., λ_A and λ_B in Figure 1), each of which can accommodates one or more channels, comprising:

a) two node (A' and B' in Figure 1) disjoint bi-directional optical waveguides (112 and 114 in Figure 1), each of which is configured to carry one or more of the counterpropagating WDM optical communications signals (e.g., λ_A and λ_B in Figure 1);

b) optical signal transmitting means (a transmitter is inherently present in the system so that the signal λ_A can be transmitted), at each end of the network, for

transmitting one or more of the WDM optical communications signals having distinct wavelengths or bands of wavelengths;

c) optical signal receiving means (a treceiver is inherently present in the system so that the signal λ_B can be received), at each end of the network, for receiving one or more WDM optical communications signals having distinct wavelengths or bands of wavelengths other than the wavelengths or bands of wavelengths of the signals sent by the transmitting means located at the same end of the network as said receiving means;

d) coupling means, at each end of the network, for adding the optical signals of the transmitting means at that end of the network to the waveguide and removing the optical signals received at the same end of the network from the waveguide (in Figure 1, the coupler is not shown to add and drop the wavelengths λ_A and λ_B; however, such kind of devices must be present in the system, so that the wavelengths λ_A and λ_B can be transmitted/received through a single bi-directional fiber);

e) waveguide failure detection means (Tap coupler 117, 118, 125 and 126, and photodetector 121, 122, 127 and 128 in Figure 1), connected to the coupling means (at each end of the two bi-directional optical waveguides, for detecting a failure of one of the waveguides and switching the transmission path of bi-directional optical signals from the failed waveguide to the other waveguide, said detection means comprising:

i) a 1x2 optical switch (116 or 124 in Figure 1) capable of switching one end of the transmission path of one or more optical signals from one bi-directional optical waveguide to the other waveguide;

ii) two optical splitters (Tap coupler 117 and 118, or Tap 125 and 126), one connected to each of the two bi-directional optical waveguides, for tapping optical power received from the optical signals sent by the transmitting means located at the opposite end of the respective waveguide;

iv) optical means (photodetector 121 and 122, or 127 and 128), for detecting a drop in the optical power of the optical signals received from the transmitter at the opposite end of the bi-directional optical waveguides; and

v) control electronics (controller 123 in Figure 1) for switching one end of the transmission path of the bi-directional optical signals from one bi-directional optical waveguide to the other when an optical power drop is detected in the bi-directional optical signals transmitted along the first bi-directional optical waveguide by the detection means.

But, in Figure 1, Jasti does not expressly disclose an optical filter connected to each splitter that rejects signals of the wavelengths or bands of wavelength transmitted by the transmitter located at the same end of the bi-directional optical waveguides as the filter and accepts signals of the wavelengths or bands of wavelengths transmitted by the transmitter located at the opposite end of the bi-directional optical waveguides.

However, to use a filter to get a specific wavelength is well known and a widely practice in the art. Pfeiffer discloses a wavelength-selective optical coupler (Figure 2, column 3, line 38-42) to filter a specific wavelength for the photodetector, the wavelength-selective optical coupler functions exactly as the conventional coupler with

a filter. Another prior art, Evans et al, also teaches that the wavelength-selective optical coupler can be replaced by a tap coupler and a filter (Figure 3, [0014], [0032]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a optical filter as widely used in the art to the system of Jasti so that a specific wavelength or wavelength band can be extracted and detected, and then interference from other wavelength components can be reduced and the measurement of the power variation can be more accurate.

2). With regard to claims 2-4, Jasti and Pfeiffer and Evans et al disclose all of the subject matter as applied to claim 1 above. And Jasti and Pfeiffer and Evans et al further disclose wherein said network employs any switching, transmission and other communications technology and signal multiplexing scheme, protocol or technology; incorporating any network topology ([0001]).

3). With regard to claim 5, Jasti and Pfeiffer and Evans et al disclose all of the subject matter as applied to claim 1 above. And Jasti teaches that the controller determine the switching position based on the electrical signal from the photodetector. And Pfeiffer also teaches that a predetermined threshold is used for sending a control signal.

But, Jasti et al does not expressly disclose wherein an optical path is considered out of service when the received optical signal power measured by the optical detection means is more than **2 dB** below the level recorded when the equipment is initially set up.

Although Jasti and Pfeiffer don't specifically disclose the threshold is more than 2 dB below the level recorded when the equipment is initially set up, such limitation is merely a matter of design choice and would have been obvious in the system of Jasti and Pfeiffer. Jasti and Pfeiffer teach that an optical path is considered out of service when the received optical signal power measured by the optical detection means is below the predetermined threshold. The limitations in claim 5 do not define a patentably distinct invention over that in Jasti and Pfeiffer since both the invention as a whole and Jasti and Pfeiffer are directed to use a predetermined threshold to determine the switching. Therefore, to have the threshold to be 2 dB or 2.5 dB or 1.5 dB below the level recorded when the equipment is initially set up would have been a matter of obvious design choice to one of ordinary skill in the art.

4). With regard to claim 6, Jasti and Pfeiffer and Evans et al disclose all of the subject matter as applied to claim 1 above. But Jasti et al does not expressly wherein each optical splitter taps no less than 1% of the optical power received from the far end of the optical waveguide.

However, how many percentage of the optical power should be tapped is just a design choice. The percentage in which the power is tapped is inconsequential for the invention as a whole and presents no new or unexpected results, so long as a small portion of the optical signal is successfully tapped and detected by the photodetector. And Evans et al also teaches that around 1% of the optical power can be tapped to the photodetector. Therefore, it would be obvious that each optical splitter can tap no less

than 1% of the optical power so that the photodetector can determine whether power loss occurs.

5). With regard to claim 7, Jasti and Pfeiffer and Evans et al disclose all of the subject matter as applied to claim 1 above. But Jasti et al does not expressly wherein each optical filter has an isolation effect of at least 4 dB on the wavelength to be rejected.

It is well known that the isolation effect of an optical filter depends on the separation (or different) between the wavelengths (or wavelength bands), e.g., λ_A and λ_B. A optical filter with an isolation more than 20 dB to an adjacent wavelength just 0.5 nm away from the center wavelength of the filter is well known and conventionally used in the art. Therefore, it would be obvious that an isolation effect of at least 4 dB on the wavelength to be rejected can be used in the system of Jasti and Pfeiffer and Evans et al so that the interference from other wavelength components can be effectively removed and the accuracy of the measurement of the power variation can be improved.

3. Claims 8-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung et al (US 2005/0008362) in view of Oberg et al (US 2005/0084262) and Jasti (US 2004/0156579) and Pfeiffer (US 6,925,219).

1). With regard to claim 8, Jung et al discloses a bi-directional wavelength division multiplexed (WDM) optical communications network (Figure 3) having a protection switching capability (e.g., switches 308 and 341 in Figure 3) within two bi-directional optical waveguides (310 and 312 in Figure 3), wherein the transmission scheme can accommodate one or more optical signals at distinct wavelengths or bands

of wavelengths (Figure 4), each of which can accommodates one or more channels (Figure 4), comprising:

a) two node (e.g., 300 and 340 in Figure 3) disjoint bi-directional optical waveguides (310 and 312 in Figure 3), each of which is configured to carry one or more of the counterpropagating WDM optical communications signals (down stream and upstream signals, Figure 4);

In Figure 3, Jung et al presents a WDM-PON system with N working sources and protection sources, so the Figure 3 looks complicated. The following Figure O1 is a simplified plot, only one working source and one protection source are depicted to show the basis structure of Jung et al's system.

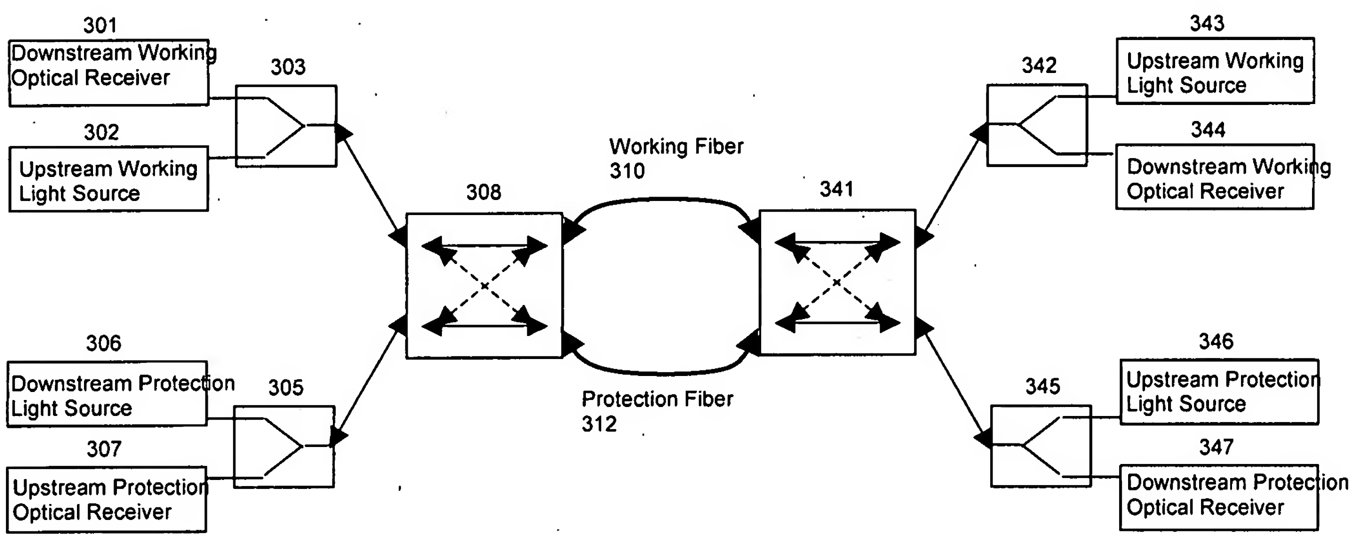

Figure O1 (simplified Figure 3 of Jung et al)

b) optical signal transmitting means (301 or 343 in Figure 3 or above Figure O1), at each end of the network, for transmitting one or more of the WDM optical communications signals having distinct wavelengths or bands of wavelengths;

c) optical signal receiving means (302 or 344 in Figure 3 or above Figure O1), at each end of the network, for receiving one or more WDM optical communications signals having distinct wavelengths or bands of wavelengths other than the wavelengths or bands of wavelengths of the signals sent by the transmitting means located at the same end of the network as said receiving means;

d) coupling means (303 or 342 in Figure 3 or above Figure O1), at each end of the network, for adding the optical signals of the transmitting means at that end of the network to the waveguide and removing the optical signals received at the same end of the network from the waveguide;

e) waveguide failure detection means for detecting a failure of one of the waveguides and switching the transmission path of bi-directional optical signals from the failed waveguide to the other waveguide ([0042], Jung et al teaches that if failure is detected, signals are sent to the 2x2 switches and change the 2x2 switching into cross states; therefore, a failure detection means must be present in the system, so that the fiber failure can be detected), said detection means comprising control electronics for switching one end of the transmission path of the bi-directional optical signals from one bi-directional optical waveguide to the other when an optical power drop is detected in the bi-directional optical signals transmitted along the first bi-directional optical waveguide by the detection means (Jung et al discloses that the CO 300 and the

subscriber units 340-1 to 340-N-1 changes the 2x2 optical switching units 308 and 341 into cross states in such a way that the CO 300 can communicate with the individual subscribers over the trunk protection fiber 312; therefore, a control unit must be present in Jung et al's system so that the switches can be controlled).

f) additional equipment from the group of equipment comprising dummy lasers, optical transmitters (e.g., 306 or 346 in Figure 3 or Figure O1) , optical receivers (e.g., 307 or 347 in Figure 3 or Figure O1), optical couplers (e.g., 305 or 345 in Figure 3 or Figure O1) connected to each 2x2 switch (308 or 341 in Figure 3 or Figure O1) to enable either the constant monitoring of the second standby waveguide, provide back up for the optical transmitters, optical receivers and optical couplers connected to the primary waveguide through the switch (Figures 7 and 8, [0046]-[0051]) and/or enable carriage of low priority traffic on the second standby waveguide as long as it is in standby mode.

Although Jung et al does not expressly disclose that the light source 306 and 346 is used for carriage of low priority traffic on the second standby waveguide as long as it is in standby mode. It is obvious that it is **enable** carriage of low priority traffic on the second standby waveguide as long as it is in standby mode. Oberg et al teaches a similar system (e.g., Figure 11) which is enable carriage of low priority traffic on the second standby waveguide as long as it is in standby mode ([0091]-0093]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the different routing of high priority and low priority

signals as taught by Oberg et al to the system of Jung et al so that a high priority signal can be always protected.

Jung et al teaches the monitoring of the power loss of waveguide. But, Jung et al does not expressly disclose the waveguide failure detection means comprising:

waveguide failure detection means, connected to the coupling means at each end of the two bi-directional optical waveguides, for detecting a failure of one of the waveguides and switching the transmission path of bi-directional optical signals from the failed waveguide to the other waveguide, said detection means comprising: i) a 2x2 optical switch capable of switching one end of the transmission path of an optical signal from one bi-directional optical waveguide to the other waveguide; ii) two optical splitters, one connected to each of the two bi-directional optical waveguides, for tapping optical power received from the optical signals sent by the transmitting means located at the opposite end of the respective waveguide; iii) an optical filter connected to each splitter that rejects signals of the wavelengths or bands of wavelength transmitted by the transmitter located at the same end of the bi-directional optical waveguides as the filter and accepts signals of the wavelengths or bands of wavelengths transmitted by the transmitter located at the opposite end of the bi-directional optical waveguides; iv) optical means, connected to each filter, for detecting a drop in the optical power of the optical signals received from the transmitter at the opposite end of the bi-directional optical waveguides; and v) control electronics for switching one end of the transmission path of the bi-directional optical signals from one bi-directional optical waveguide to the

other when an optical power drop is detected in the bi-directional optical signals transmitted along the first bi-directional optical waveguide by the detection means.

However, Jasti, in the same field of endeavor, teaches a waveguide failure detection means (e.g., Tap coupler 117, 118, 125 and 126, and photodetector 121, 122, 127 and 128 in Figure 1), connected to the coupling means at each end of the two bi-directional optical waveguides, for detecting a failure of one of the waveguides and switching the transmission path of bi-directional optical signals from the failed waveguide to the other waveguide, said detection means comprising:

i) a 2x2 optical switch (116 or 124 in Figure 1) capable of switching one end of the transmission path of an optical signal from one bi-directional optical waveguide to the other waveguide;

ii) two optical splitters (Tap coupler 117 and 118, or Tap 125 and 126), one connected to each of the two bi-directional optical waveguides, for tapping optical power received from the optical signals sent by the transmitting means located at the opposite end of the respective waveguide;

iv) optical means (photodetector 121, 122), connected to each filter, for detecting a drop in the optical power of the optical signals received from the transmitter at the opposite end of the bi-directional optical waveguides; and

v) control electronics (controller 123 in Figure 1) for switching one end of the transmission path of the bi-directional optical signals from one bi-directional optical waveguide to the other when an optical power drop is detected in the bi-directional

optical signals transmitted along the first bi-directional optical waveguide by the detection means.

But, in Figure 1, Jasti does not expressly disclose an optical filter connected to each splitter that rejects signals of the wavelengths or bands of wavelength transmitted by the transmitter located at the same end of the bi-directional optical waveguides as the filter and accepts signals of the wavelengths or bands of wavelengths transmitted by the transmitter located at the opposite end of the bi-directional optical waveguides.

However, to use a filter to get a specific wavelength is well known and a widely practice in the art. Pfeiffer discloses a wavelength-selective optical coupler (Figure 2, column 3, line 38-42) to filter a specific wavelength for the photodetector, the wavelength-selective optical coupler functions exactly as the conventional coupler with a filter.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a optical filter as widely used in the art to the system of Jung et al so that a specific wavelength or wavelength band can be extracted and detected, and then interference from other wavelength components can be reduced and the measurement of the power variation can be more accurate.

2). With regard to claims 9-11, Jung et al and Oberg et al and Jasti and Pfeiffer disclose all of the subject matter as applied to claim 8 above. And Jung et al and Oberg et al and Jasti and Pfeiffer further disclose wherein said network employs any switching, transmission and other communications technology and signal multiplexing scheme,

protocol or technology; incorporating any network topology (Jung et al: [0003], [0016]-[0018], and Jasti: [0001]).

3). With regard to claim 12, Jung et al and Oberg et al and Jasti and Pfeiffer disclose all of the subject matter as applied to claim 8 above. And Jasti teaches that the controller determine the switching position based on the electrical signal from the photodetector. And Pfeiffer also teaches that a predetermined threshold is used for sending a control signal.

But, Jung et al and Oberg et al and Jasti et al does not expressly disclose wherein an optical path is considered out of service when the received optical signal power measured by the optical detection means is more than **2 dB** below the level recorded when the equipment is initially set up.

Although Jung and Oberg et al and Jasti and Pfeiffer don't specifically disclose the threshold is more than 2 dB below the level recorded when the equipment is initially set up, such limitation is merely a matter of design choice and would have been obvious in the system of Jung et al and Jasti and Pfeiffer. Jung et al and Jasti and Pfeiffer teach that an optical path is considered out of service when the received optical signal power measured by the optical detection means is below the predetermined threshold. The limitations in claim 12 do not define a patentably distinct invention over that in Jung et al and Jasti and Pfeiffer since both the invention as a whole and Jung et al and Jasti and Pfeiffer are directed to use a predetermined threshold to determine the switching. Therefore, to have the threshold to be 2 dB or 2.5 dB or 1.5 dB below the level recorded

when the equipment is initially set up would have been a matter of obvious design choice to one of ordinary skill in the art.

4). With regard to claim 14, Jung et al and Oberg et al and Jasti and Pfeiffer disclose all of the subject matter as applied to claim 8 above. But, Jung et al does not expressly disclose wherein each optical filter has an isolation effect of at least 4 dB on the wavelength to be rejected.

It is well known that the isolation effect of an optical filter depends on the separation (or different) between the wavelengths (or wavelength bands), e.g., λ_A and λ_B. A optical filter with an isolation more than 20 dB to an adjacent wavelength just 0.5 nm away from the center wavelength of the filter is well known and conventionally used in the art. Therefore, it would be obvious that an isolation effect of at least 4 dB on the wavelength to be rejected can be used in the system of Jung et al and Oberg et al and Jasti and Pfeiffer so that the interference from other wavelength components can be effectively removed and the accuracy of the measurement of the power variation can be improved.

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jung et al and Oberg et al and Jasti (US 2004/0156579) and Pfeiffer (US 6,925,219) as applied to claim 1 above, and in further view of Evans et al (US 2005/0174563).

Jung et al and Oberg et al and Jasti and Pfeiffer disclose all of the subject matter as applied to claim 8 above. But Jung et al and Jasti do not expressly teach wherein each optical splitter taps no less than 1% of the optical power received from the far end of the optical waveguide.

However, how many percentage of the optical power should be tapped is just a design choice. The percentage in which the power is tapped is inconsequential for the invention as a whole and presents no new or unexpected results, so long as a small portion of the optical signal is successfully tapped and detected by the photodetector. And Evans et al teaches that around 1% of the optical power can be tapped to the photodetector. Therefore, it would be obvious that each optical splitter can tap no less than 1% of the optical power so that the photodetector can determine whether power loss occurs.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Park et al (US 2005/0036444).

Corke et al (US 5,510,917).

Jasti et al (US 2005/0111847).

Choi et al (US 2005/0031348).

Henmi (US 6,137,603).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 8:00 am - 5:30 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Li Liu
July 31, 2007

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER